Figure 1

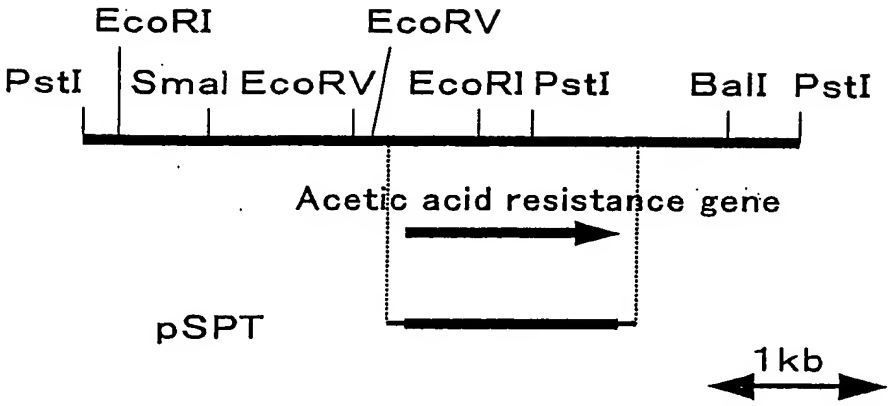


Figure 2

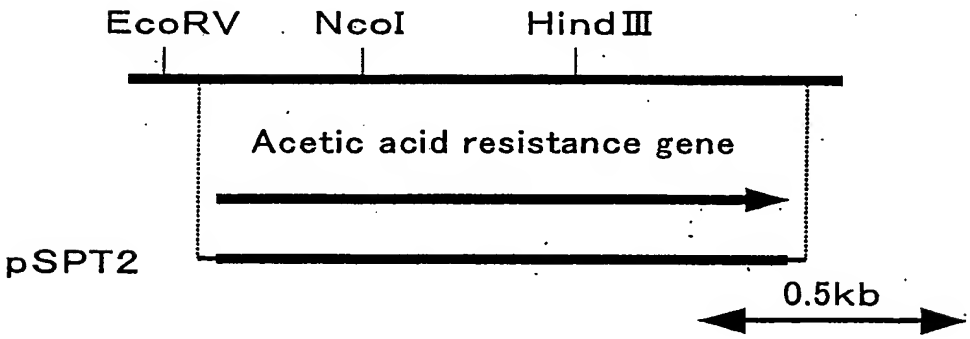


Figure 3

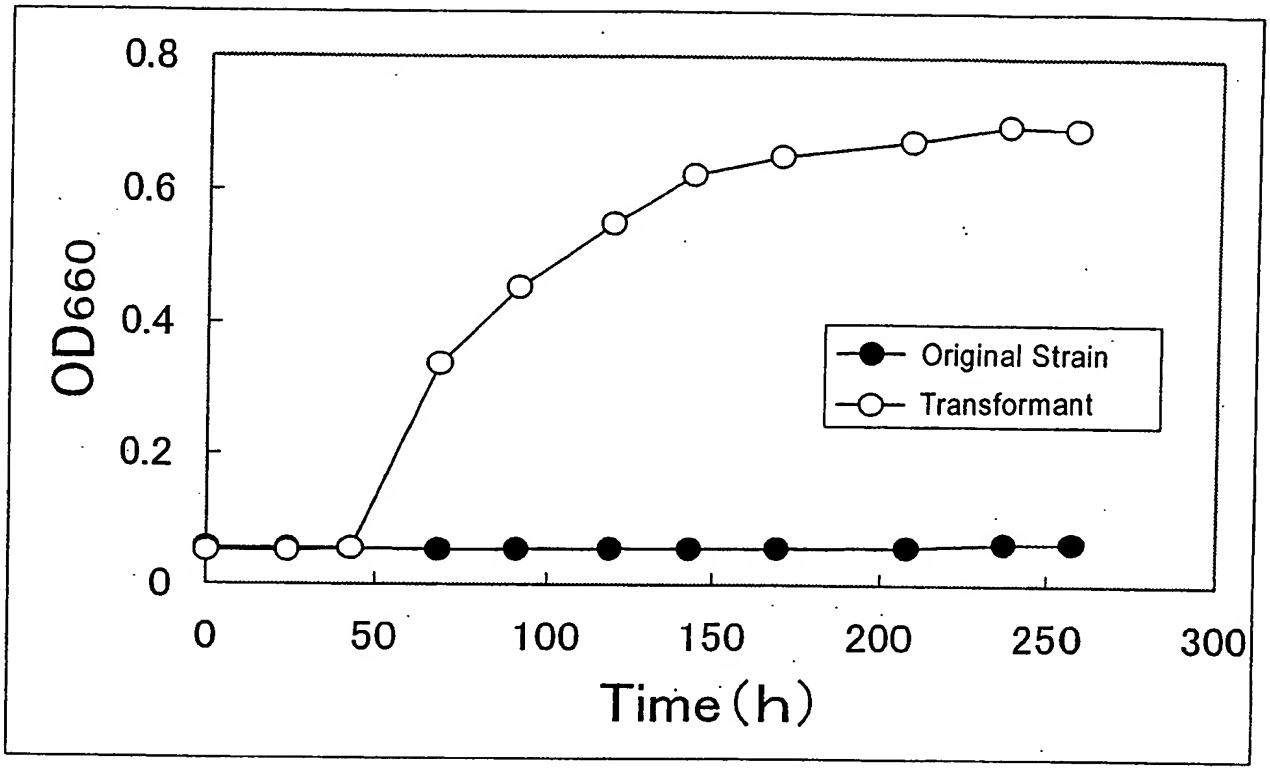
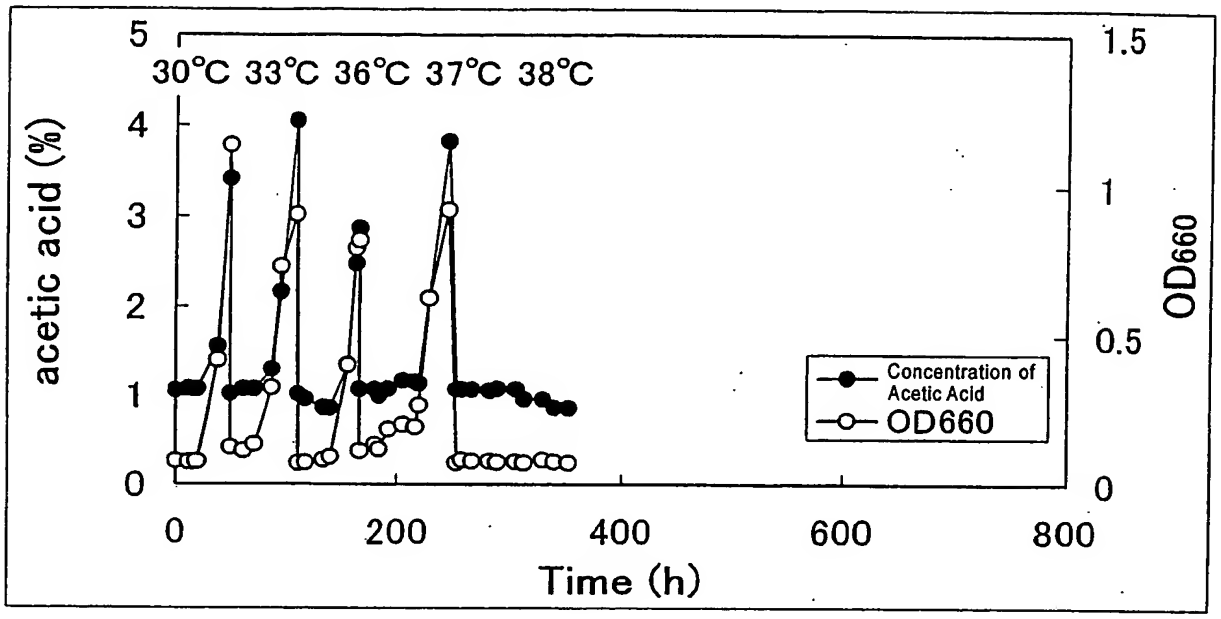

0.8
0.6
0.4
0.2
0
OD660
0
50
100
150
200
250
300
Time (h)
Original Strain
Transformant

Figure 4

Fermentation Process of Original Strain



Fermentation Process of Transformant

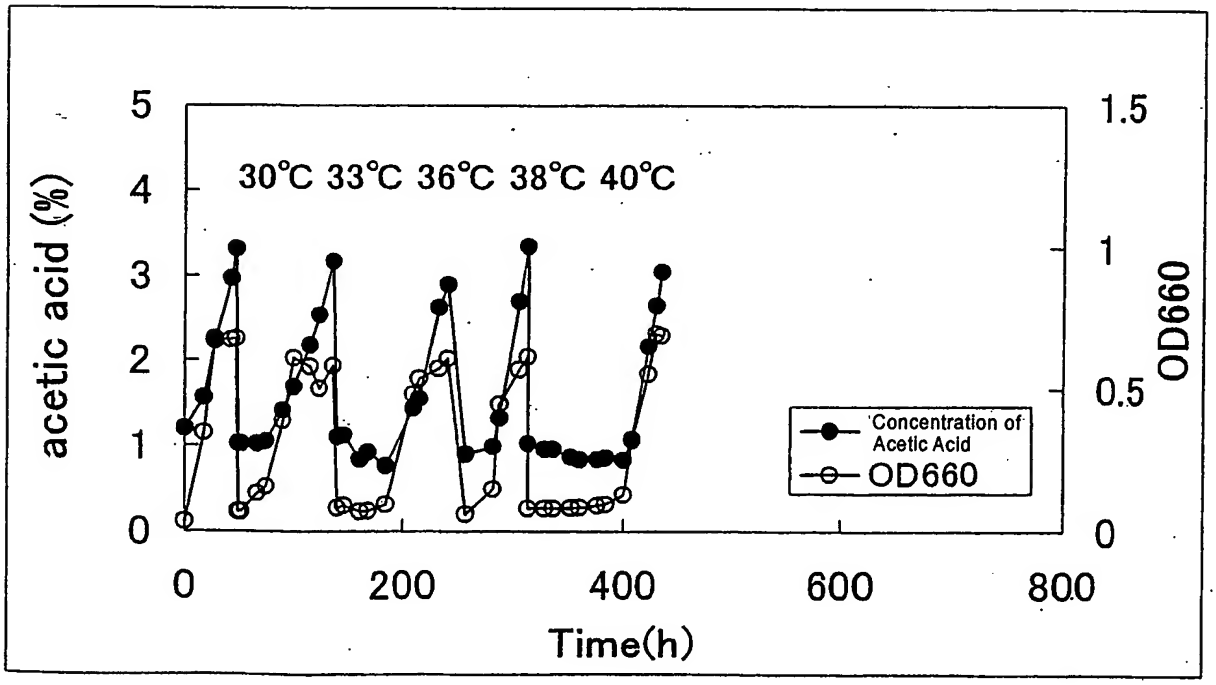


Figure 5

MetSerIlePheSerLysTyrGluGlyLeu AlaSerAlaLeuSerAlaValThrAlaAsp 20

GlyGlyArgAsnProPheAsnValValIle GluLysProIleSerSerThrValGlyLeu 40

IleGluGlyArgGluThrLeuLeuPheGly ThrAsnAsnTyrLeuGlyLeuSerGlnSer 60

ProAlaAlaIleGluAlaAlaValGluAla AlaArgAlaTyrGlyValGlyThrThrGly 80

SerArgIleAlaAsnGlyThrGlnGlyLeu HisArgGlnLeuGluGluArgLeuCysThr 100

PhePheArgArgArgHisCysMetValPhe SerThrGlyTyrGlnAlaAsnLeuGlyThr 120

IleSerAlaLeuAlaGlyLysAspAspTyr LeuLeuLeuAspAlaAspSerHisAlaSer 140

IleTyrAspGlySerArgLeuGlyHisAla GlnValIleArgPheArgHisAsnAspAla 160

AspAspLeuHisLysArgLeuArgArgLeu AspGlyThrProGlyAlaLysLeuValVal 180

ValGluGlyIleTyrSerMetMetGlyAsp ValValProMetAlaGluPheAlaAlaVal 200

LysArgGluThrGlyAlaTrpLeuLeuAla AspGluAlaHisSerValGlyValMetGly 220

GluHisGlyArgGlyValAlaGluSerAsp GlyValGluAspAspValAspPheValVal 240

GlyThrPheSerLysSerLeuGlyThrVal GlyGlyTyrCysValSerAsnHisAlaGly 260

LeuAspLeuIleArgLeuCysSerArgPro TyrMetPheThrAlaSerLeuProProGlu 280

ValIleAlaAlaThrMetAlaAlaLeuThr GluLeuGluAsnArgProGluLeuArgVal 300

ArgLeuMetAspAsnAlaArgArgLeuHis AspGlyLeuGlnAlaAlaGlyLeuArgThr 320

GlyProGlnAlaSerProValValSerVal IleLeuAspAspValAlaValAlaValAla 340

PheTrpAsnArgLeuLeuAspLeuGlyVal TyrValAsnLeuSerLeuProProAlaThr 360

ProAspGlnHisProLeuLeuArgThrSer ValMetAlaThrHisThrProGluGlnIle 380

AspArgAlaValGluIlePheAlaValVal AlaGlyGluMetGlyIleAsnArgAlaAla 400

Figure 6

MetThrSerLeuPheSerLysPheGluGly ThrAlaGlyAlaLeuGlySerValValAla 20

ValGlyGlyArgAsnProPheAlaValVal IleGluLysProValSerSerThrValGly 40

IleIleGluGlyArgGluThrLeuLeuPhe GlyThrAsnAsnTyrLeuGlyLeuSerGln 60

SerLysAsnAlaIleGlnAlaAlaGlnGln AlaAlaAlaAlaCysGlyValGlyThrThr 80

GlySerArgIleAlaAsnGlyThrGlnSer LeuHisArgGlnLeuGluLysAspIleAla 100

AlaPhePheGlyArgArgAspAlaMetVal PheSerThrGlyTyrGlnAlaAsnLeuGly 120

IleIleSerThrLeuAlaGlyLysAspAsp HisLeuPheLeuAspAlaAspSerHisAla 140

SerIleTyrAspGlySerArgLeuSerAla AlaGluValIleArgPheArgHisAsnAsp 160

ProAspAsnLeuTyrLysArgLeuLysArg MetAspGlyThrProGlyAlaLysLeuIle 180

ValValGluGlyIleTyrSerMetThrGly AsnValAlaProIleAlaGluPheValAla 200

ValLysLysGluThrGlyAlaTyrLeuLeu ValAspGluAlaHisSerPheGlyValLeu 220

GlyGlnAsnGlyArgGlyAlaAlaGluAla AspGlyValGluAlaAspValAspPheVal 240

ValGlyThrPheSerLysSerLeuGlyThr ValGlyGlyTyrCysValSerAspHisPro 260

GluLeuGluPheValArgLeuAsnCysArg ProTyrMetPheThrAlaSerLeuProPro 280

GluValIleAlaAlaThrThrAlaAlaLeu LysAspMetGlnAlaHisProGluLeuArg 300

LysGlnLeuMetAlaAsnAlaGlnGlnLeu HisAlaGlyPheValAspIleGlyLeuAsn 320

AlaSerLysHisAlaThrProValIleAla ValThrLeuGluThrAlaGluGluAlaIle 340

ProMetTrpAsnArgLeuLeuGluLeuGly ValTyrValAsnLeuSerLeuProProAla 360

ThrProAspSerArgProLeuLeuArgCys SerValMetAlaThrHisThrProGluGln 380

IleAlaGlnAlaIleAlaIlePheArgGln AlaAlaAlaGluValGlyValThrIleThr 400

ProSerAlaAla

Figure 7

5'—CTGGCTGCCTGTATCGTCTCTCTCAAGCAG—3'

Figure 8

5'—ACGGCTGCAGCTGGTCTTGCCGTATCT—3'

Figure 9

5'-GGCAAACCTCGGCATTATTTCCACGCTGGC-3'

Figure 10

5'-GCGAATCTGGTGTAGCCGGAGGAAGGCTG-3'

Figure 11

5'-GCCAGCGTGGAAATAATGCCGAGGTTTGCC-3'

Figure 12

5'-CAGCCTTCCTCCGGCTACACCAGATTCGC-3'